SEL UNIVERSITY
POWER THROUGH KNOWLEDGE

Quotient or Division of Powers

Video Script

Let us now see what happens when we divide powers of the same base.

$$\frac{4^5}{4^3} = \frac{4\times4\times4\times4\times4}{4\times4\times4} = 4\times4 = 4^2 = 4^{(5-3)}$$

Four to the power of five, divided by four to the power of three. If you write this out, you have four times four times four times four times four, divided by four times four times four. We can cancel out three of the fours from both the numerator and denominator. We are left with four times four, or four squared, which is the same as four to the power of five minus three.

$$\frac{a^5}{a^3} = a^{(5-3)} = a^2$$

Similarly, *a* to the power of five, divided by *a* to the power of three, is the same as *a* to the power of five minus three, or *a* squared.

Therefore, when we divide powers having the same base, we subtract the index of the denominator from the index of the numerator.

$$\frac{a^m}{a^n} = a^{(m-n)}$$

In general, the law of division of powers is: *a* to the power of *m*, divided by *a* to the power of *n* is equal to *a* to the power of *m* minus *n*.